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Complete Specification  
entitled <sup>(54)</sup> LIQUID SPRAY DEVICES

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Related Art <sup>(56)</sup>	225020	(24913/57)	31.9, 74.9
	238338	(37662/58)	68.9, 29.2
	121856	(14334/44)	31.9, 74.9

The following statement is a full description of this invention, including the best method of performing it known to us :

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F. D. Atkinson, Government Printer, Canberra

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This invention relates to liquid spray devices.

It is an object of the present invention to provide a liquid spray device which can be fitted inside a container such as a bulk milk tank, and which gives a better coverage of cleaning liquid over the inside of the tank than known devices.

According to the present invention, there is provided a liquid spray device comprising an outlet pipe with an outlet opening from which liquid can discharge in the downward direction, a bearing support beneath the outlet opening, a spinner disc mounted on the bearing support so that it is freely rotatable about an axis co-axial with the axis of the outlet opening, the said disc having an upstanding central conical boss which is spaced beneath the outlet opening and in which the bearing support is located and a plurality of upstanding teeth spaced round the upper surface and shaped so that liquid falling from the outlet opening on to the upper surface of the disc will cause the disc to rotate and will be thrown outwards and upwards. The device is such that it can be completely immersed in the liquid in the tank but when the tank is emptied can be used to spray liquid over the interior of the tank.

The single figure of the accompanying drawings is an elevation, partly in section, of a spray device according to the invention.

In the illustrated embodiment of the invention, a spraying device comprises a vertical outlet pipe 1 for liquid to be sprayed. This pipe has a lower portion which tapers towards an outlet opening 2 at the bottom of the pipe.

An orifice plate 3 is located in the outlet pipe slightly above, i.e. upstream of, the outlet face of the pipe. This orifice plate 3 is arranged to ensure that the liquid issues with a desired flow pattern.

A spinner 4 is arranged in the flow of liquid from the outlet opening 2 to distribute liquid to be sprayed.

This spinner 4 is mounted on a support assembly which comprises a wire bracket 5 secured to the lower portion of the outlet pipe 1. The wire bracket 5 is of a substantially U-shape with one limb (5a) of the U shorter than the other. The short limb 5a of the U is arranged beneath the bottom outlet opening 2 of the pipe 1 and is coaxial with the outlet pipe. The taller limb 5b of the U is, of course, off-set to one side of the axis of the pipe 1, and has an extension 5c which is inclined towards and is secured to, the lower portion of the outlet pipe 1. The short limb 5a of the bracket has a support bearing peg 6 secured to it. The outlet pipe 1 and the bearing peg 6 are of plastics material and are moulded together, the wire bracket 5 being inserted in the mould prior to moulding so that a unitary structure is obtained. The upper end of the peg 6 terminates in a spherical bearing 7 for the spinner 4. The spherical bearing 7 is co-axial with the outlet pipe.

The spinner 4 is a moulding of plastics material such as polypropylene and is in the form of a circular disc with a central cone or boss 8 projecting upwards from the upper face. Spinners of this kind are generally known as "Mexican Hat" spinners because their shape resembles the shape of such a hat.

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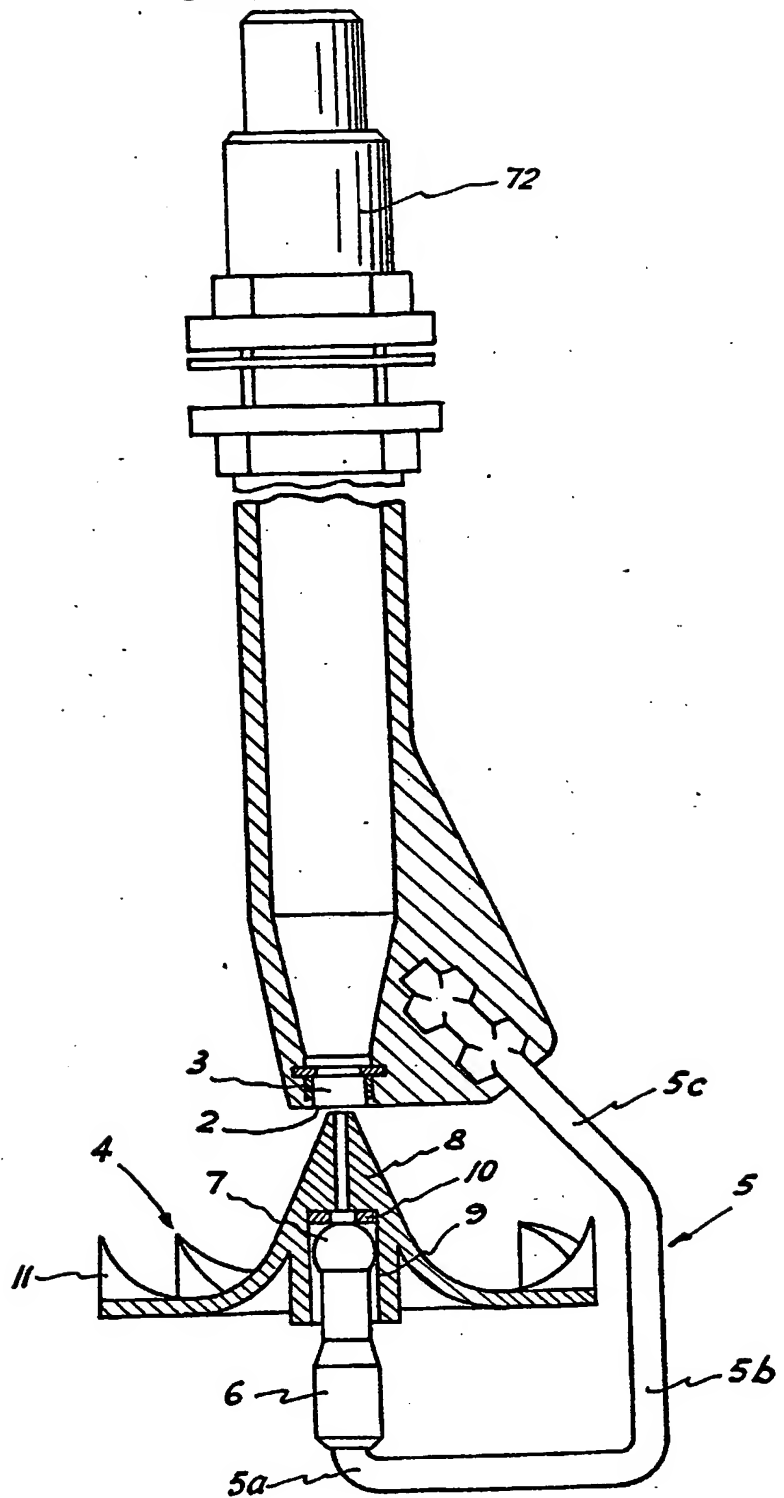
The cone 8 has internal cylindrical recess 9 which opens on the underside of the spinner disc and fits over the spherical bearing 7 on the support peg 6. A disc 10 of a low friction material, preferably P.T.F.E., is fitted inside the cylindrical recess 9 in the boss 8, of the spinner and is seated on top of the spherical bearing 7 on the support peg 6. The relative sizes of the support peg and its bearing and the inside of the cylindrical recess are such that there is a clearance between the inside of the recess and the support peg. Thus, the spinner 4 can rotate freely on the bearing and can also gyrate. When the spinner 4 is in position on top of the support peg 6, the top of the cone or boss 8 is spaced from the bottom of the outlet tube 1. No part of the spinner cone 8 is enclosed within the outlet tube 1, during a spraying operation or when a tank in which the device is fitted is empty or contains liquid to a level below that of the spinner. However, when the level of liquid is above the spinner the spinner will float off the bearing, but cannot float away because movement is limited by the spherical bearing 7 at the bottom and the outlet pipe 1 at the top. A plurality of teeth 11 are spaced around the upper side of the disc. These teeth 11 are so shaped that when liquid is discharged from the bottom outlet 2 of the pipe 1, it will fall on the upper surface of the spinner disc, so that the disc is caused to rotate. The upstanding teeth 11 on the spinner disc have crests which are feathered in such a way that liquid falling on the teeth will be thrown upwards as well as being thrown outwards. This arrangement ensures that when the

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device is fitted inside a tank, cleaning liquid can be applied by the device to the area immediately above the spinner. A defect of known devices with spinner liquid distributors is that the liquid is not efficiently applied to the area immediately above the spinner.

The outlet pipe 1 is provided near its top with a stepped locking device 12 which enables it to be fixed to a bulk head and will also enable various sizes of the tubing to be connected to the outlet pipe.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A liquid spray device comprising an outlet pipe with an outlet opening from which liquid can discharge in the downward direction, a bearing support beneath the outlet opening, a spinner disc mounted on the bearing support so that it is freely rotatable about an axis co-axial with the axis of the outlet opening, the said disc having an upstanding central conical boss which is spaced beneath the outlet opening and in which the bearing support is located and a plurality of upstanding teeth spaced round the upper surface and shaped so that liquid falling from the outlet opening on to the upper surface of the disc will cause the disc to rotate and will be thrown outwards and upwards.

2. A device as claimed in Claim 1, wherein an orifice plate is located in the outlet opening.

3. A device as claimed in either preceding claim wherein the conical boss has a cylindrical recess opening on the underside of the disc and a disc of low-friction material is arranged inside the recess and is seated on a spherical bearing of the bearing support.

4. A liquid spray device substantially as described with reference to the accompanying drawing.



DATED this 4th day of April, 1973.

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